**In the Claims:**

This listing of claims will replace all prior versions, and listings, of claims in the application:

**Listing of Claims:**

1. (Currently Amended)       A system for locating at least one target device that supports a required service in an ad-hoc communications network connecting at least one device and supporting at least one service, wherein each said at least one target device is one of said at least one device and the required service is one of said at least one service, comprising:

a memory device; and

processor disposed in communication with the memory device, the processor configured to:

conduct an inquiry of the ad-hoc communications network to discover at least one nearby peer device in said at least one device, the inquiry including an indication that said at least one nearby device may include a middleware layer, said middleware layer being middleware software for providing application and service discovery;

when the inquiry includes the indication that said at least one nearby peer device may include the middleware layer:

create a connection to a peer device of said at least one nearby peer device;

confirm whether the peer device includes the middleware layer;

when the peer device includes the middleware layer:

· send a service discovery request to the peer device; and

receive a response to the service discovery request, the response including distributed information,

wherein the distributed information includes at least one reference to the required service, ~~and~~ an association between each reference and one of said at least one target device, and state information about said at least one target device.

2. (Original)  The system of claim 1, wherein a density of said at least one nearby device over a coverage area for the ad-hoc communications network is high.

3. (Original)  The system of claim 1, wherein the distributed information includes at least one information record, each information record including at least one of device information or application information.

4. (Original)  The system of claim 3, wherein the device information includes state information, an address, a friendly name, a hop count, a sequence number, a time value, and a time counter.

5. (Original)  The system of claim 3, wherein the application information includes an application identifier, capability information, version information, state information, an address, a hop count, a sequence number, a time value, and a time counter.

6. (Original)  The system of claim 3, wherein when the peer device includes the middleware layer, the processor is further configured to:

    store the disclosed information in a portion of the memory device,

    wherein the portion includes at least one record.

7. (Original)  The system of claim 6, wherein when the portion of the memory device is full, to

store the disclosed information, the processor is further configured to:

      identify an oldest record of said at least one record; and

      overwrite the oldest record with a new information record from said at least one information

          record.

8. (Original)   The system of claim 6, wherein when the portion of the memory device is full, to

store the disclosed information, the processor is further configured to:

      identify an old record of said at least one record;

      identify a new information record from said at least one information record, the new

          information record being a replacement for the old record; and

      overwrite the old record with the new information record.

9. (Original)   The system of claim 1, wherein a portion of the memory device includes exchanged

information that identifies at least one application or service that said at least one nearby device

supports.

10. (Original)  The system of claim 9, wherein when receiving an inquiry request from one of said

at least one nearby device, the processor is further configured to:

      distribute the exchanged information as part of a service discovery response.

11. (Original)  The system of claim 1, wherein when the peer device includes the middleware layer,

the processor is further configured to:

      establish a link connection to one of said at least one target device; and

      access the requested service.

12. (Currently Amended)     A method for locating at least one target device that supports a

required service in an ad-hoc communications network connecting at least one device and

supporting at least one service, wherein each said at least one target device is one of said at least one

device and the required service is one of said at least one service, comprising:

conducting an inquiry of the ad-hoc communications network to discover at least one nearby

peer device in said at least one device, the inquiry including an indication that said at least one

nearby device may include a middleware layer, said middleware layer being middleware software

for providing application and service discovery;

when the inquiry includes the indication that said at least one nearby peer device may

include the middleware layer:

creating a connection to a peer device of said at least one nearby peer device;

confirming whether the peer device includes the middleware layer;

when the peer device includes the middleware layer:

sending a service discovery request to the peer device; and

receiving a response to the service discovery request, the response including distributed

information,

wherein the distributed information includes at least one reference to the required service,

and an association between each reference and one of said at least one target device, and state

information about said at least one target device.

13. (Original)  The method of claim 12, wherein a density of said at least one nearby device over a

coverage area for the ad-hoc communications network is high.

14. (Original) The method of claim 12, wherein the distributed information includes at least one information record, each information record including at least one of device information or application information.

15. (Original) The method of claim 14, wherein the device information includes state information, an address, a friendly name, a hop count, a sequence number, a time value, and a time counter.

16. (Original) The method of claim 14, wherein the application information includes an application identifier, capability information, version information, state information, an address, a hop count, a sequence number, a time value, and a time counter.

17. (Original) The method of claim 14, wherein when the peer device includes the middleware layer, the method further comprises:

      storing the disclosed information in a portion of the memory device,

      wherein the portion includes at least one record.

18. (Original) The method of claim 17, wherein when the portion of the memory device is full, the storing of the disclosed information further comprises:

      identifying an oldest record of said at least one record; and

      overwriting the oldest record with a new information record from said at least one

         information record.

19. (Original) The method of claim 17, wherein when the portion of the memory device is full, the storing of the disclosed information further comprises:

identifying an old record of said at least one record;

identifying a new information record from said at least one information record, the new

information record being a replacement for the old record; and

overwriting the old record with the new information record.

20. (Original) The method of claim 12, wherein a portion of the memory device includes

exchanged information that identifies at least one application or service that said at least one nearby

device supports.

21. (Original) The method of claim 20, wherein when receiving an inquiry request from one of said

at least one nearby device, the method further comprises:

distributing the exchanged information as part of a service discovery response.

22. (Original) The method of claim 12, wherein when the peer device includes the middleware

layer, the method further comprises:

establishing a link connection to one of said at least one target device; and

accessing the requested service.

23. (Currently Amended)       A computer program product for locating at least one target device

that supports a required service in an ad-hoc communications network connecting at least one

device and supporting at least one service, wherein each said at least one target device is one of said

at least one device and the required service is one of said at least one service, comprising:

a computer readable medium storing:

program code for conducting an inquiry of the ad-hoc communications network to discover

at least one nearby <u>peer</u> device in said at least one device, the inquiry including an indication that said at least one nearby device may include a middleware layer<u>, said middleware layer being middleware software for providing application and service discovery</u>;

program code for creating a connection to ~~a peer device of~~ said at least one nearby <u>peer</u> device;

program code for confirming whether the peer device includes the middleware layer;

program code for sending a service discovery request to the peer device; and

program code for receiving a response to the service discovery request, the response including distributed information,

wherein the distributed information includes at least one reference to the required service<u>,</u> ~~and~~ an association between each reference and one of said at least one target device<u>, and state information about said at least one target device</u>.


24. (Original) The computer program product of claim 23, wherein the distributed information includes at least one information record, each information record including at least one of device information or application information.


25. (Original) The computer program product of claim 24, the computer readable medium further storing:

program code for storing the disclosed information in a portion of the memory device,

wherein the portion includes at least one record.


26. (Original) The computer program product of claim 25, wherein the program code for storing the disclosed information further comprises:

program code for identifying an oldest record of said at least one record; and

program code for overwriting the oldest record with a new information record from said at least one information record.

27. (Original) The computer program product of claim 25, wherein the program code for storing the disclosed information further comprises:

program code for identifying an old record of said at least one record;

program code for identifying a new information record from said at least one information record, the new information record being a replacement for the old record; and

program code for overwriting the old record with the new information record.

28. (Original) The computer program product of claim 23, wherein a portion of the memory device includes exchanged information that identifies at least one application or service that said at least one nearby device supports.

29. (Original) The computer program product of claim 28, wherein when receiving an inquiry request from one of said at least one nearby device, the computer readable medium further stores:

program code for distributing the exchanged information as part of a service discovery response.

30. (Original) The computer program product of claim 23, the computer readable medium further storing:

program code for establishing a link connection to one of said at least one target device; and

program code for accessing the requested service.


31. (Currently Amended)     A system for locating a target device that supports a required service

in an ad-hoc communications network connecting at least one device and supporting at least one

service, wherein the target device is one of said at least one device and the required service is one of

said at least one service, comprising:

a memory device; and

a processor disposed in communication with the memory device, the processor configured

to:

maintain a distributed database to associate each said at least one service to at least one of

said at least one device;

conduct an inquiry of the ad-hoc communications network to discover at least one nearby

device in said at least one device, the inquiry including an indication that said at least one nearby

device may include a middleware layer, said middleware layer being middleware software for

providing application and service discovery; and

access the distributed database to determine whether said at least one nearby device includes

the required service.


32. (Original) The system of claim 31, wherein the processor is further configured to:

establish a link connection with said at least one nearby device if the distributed

database includes an association between said at least one nearby device and the

required service.


33. (Original) The system of claim 32, wherein the distributed database includes at least one

reference to the required service and an association between said at least one reference and one of said at least one target device.

34. (Original) The system of claim 31, wherein the processor is further configured to:

        decline a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

35. (Currently Amended)     A method for locating a target device that supports a required service in an ad-hoc communications network connecting at least one device and supporting at least one service, wherein the target device is one of said at least one device and the required service is one of said at least one service, comprising:

maintaining a distributed database to associate each said at least one service to at least one of said at least one device;

conducting an inquiry of the ad-hoc communications network to discover at least one nearby device in said at least one device, the inquiry including an indication that said at least one nearby device may include a middleware layer, said middleware layer being middleware software for providing application and service discovery; and

accessing the distributed database to determine whether said at least one nearby device includes the required service.

36. (Original) The method of claim 35, further comprising:

        establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the

required service.


37. (Original) The method of claim 36, wherein the distributed database includes at least one

reference to the required service and an association between said at least one reference and one of

said at least one target device.


38. (Original) The method of claim 35, further comprising:

> declining a link connection with said at least one nearby device if the distributed
>
> database indicates that said at least one nearby device does not include the required
>
> service.


39. (Currently Amended)     A computer program product for locating a target device that

supports a required service in an ad-hoc communications network connecting at least one device

and supporting at least one service, wherein the target device is one of said at least one device and

the required service is one of said at least one service, comprising:

> a computer readable medium storing:

program code for maintaining a distributed database to associate each said at least one

service to at least one of said at least one device;

program code for conducting an inquiry of the ad-hoc communications network to discover

at least one nearby device in said at least one device, the inquiry including an indication that said at

least one nearby device may include a middleware layer, said middleware layer being middleware

software for providing application and service discovery; and                                    .

program code for accessing the distributed database to determine whether said at least one

nearby device includes the required service.

40. (Original)  The computer program product of claim 39, the computer readable medium further storing:

> program code for establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required service.

41. (Original)  The computer program product of claim 39, the computer readable medium further storing:

> program code for declining a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.

42. (Currently Amended)    A system for locating a target device that supports a required service in an ad-hoc communications network connecting at least one device and supporting at least one service, wherein the target device is one of said at least one device and the required service is one of said at least one service, comprising:

means for maintaining a distributed database to associate each said at least one service to at least one of said at least one device;

means for conducting an inquiry of the ad-hoc communications network to discover at least one nearby device in said at least one device, the inquiry including an indication that said at least one nearby device may include a middleware layer, said middleware layer being middleware software for providing application and service discovery; and

means for accessing the distributed database to determine whether said at least one nearby

device includes the required service.

43. (Original) The system of claim 42, further comprising:

        means for establishing a link connection with said at least one nearby device if the distributed database includes an association between said at least one nearby device and the required service.

44. (Original) The system of claim 42, further comprising:

        means for declining a link connection with said at least one nearby device if the distributed database indicates that said at least one nearby device does not include the required service.